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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/517,589	03/03/2000	Masami Hatori	Q56793	5455

7590 11/28/2003  
Sughrue Mion Zinn Macpeak & Seas PLLC  
2100 Pennsylvania Avenue N W  
Washington, DC 20037

EXAMINER

RODRIGUEZ, ARMANDO

ART UNIT	PAPER NUMBER
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2828

DATE MAILED: 11/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/517,589

Applicant(s)

HATORI ET AL.

Examiner

Armando Rodriguez

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

Paul J  
SPB 2008

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Arguments***

Applicant's arguments, see response, filed October 28, 2003, with respect to the rejection(s) of claim(s) 1-3,5-24 under 35 U.S.C. 102 (b) and claims 4,25-32 under 35 U.S.C. 103 based on the Sonoda reference have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the newly found art, which discloses the bulk shape nonlinear crystal.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 24 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: no structure has been recited for the laser to provide the recited limitation of "single-peak spatial mode".

Regarding claim 24,

The claim language does not disclose any particular structural difference between the recited semiconductor of claim 24 and the semiconductor laser of the prior art reference, thereby both lasers will provide the recited limitation of "single-peak spatial mode".

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,3,7,18-24,29,30,31 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamamoto et al (PN 5,452,312).

Regarding claims 1,3,7,18-20,24,

Figure 9 illustrates a second harmonic generating laser device having a semiconductor laser (21) emitting a fundamental wave (P1), an optical transmitting filter (50) and a light wavelength converting device (22) formed from a substrate having nonlinear optical effects, as shown the filter is located between the laser and the wavelength conversion device. The wavelength conversion device includes a mirror (61) for reflecting the fundamental wavelength, as described in the abstract and column 11 lines 5-37. In column 13 lines 45-68 to column 14 lines 1-19, Yamamoto et al discloses that a bulk-type wavelength conversion may used within the second harmonic generating laser device.

Regarding claim 21,

In column 13 lines 45-68 to column 14 lines 1-19, Yamamoto et al discloses a bulk-type wavelength conversion composed of LiTaO<sub>3</sub>.

Regarding claim 22,29,30,31,

In column 13 lines 45-68 to column 14 lines 1-19, Yamamoto et al discloses a bulk-type wavelength conversion having polarization inversion layers (3), which extend to the end surfaces of the crystal.

Regarding claim 23,

In column 13 lines 45-68, Yamamoto et al discloses using semiconductor laser of 600 mW.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2,4,5,6,8-17 and 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda (JP10254001) in view of Yamamoto et al and Urakami et al.

In figure 1 Sonoda illustrates a semiconductor laser (10), a wavelength conversion waveguide (15) and a filter (14). The waveguide and the laser form an external resonant cavity by having a high reflective coating, which reflects the laser light and outputs second harmonic light. The band pass filter will provide wavelength selection.

Sonoda is silent as to using a bulk-shaped wavelength conversion crystal.

Figure 9 Yamamoto et al illustrates a second harmonic generating laser device having a semiconductor laser (21) emitting a fundamental wave (P1), an optical transmitting filter (50) and a light wavelength converting device (22) formed from a

substrate having nonlinear optical effects, as shown the filter is located between the laser and the wavelength conversion device. The wavelength conversion device includes a mirror (61) for reflecting the fundamental wavelength, as described in the abstract and column 11 lines 5-37. In column 13 lines 45-68 to column 14 lines 1-19, Yamamoto et al discloses that a bulk-type wavelength conversion may used within the second harmonic generating laser device.

Therefore, it would have been obvious to a person having ordinary skill in the art to use a bulk-type wavelength conversion crystal within the laser device of Sonoda as suggested and taught by Yamamoto because it would provide an efficient wavelength conversion when using a high power laser.

Regarding claim 2,

Figure 7 of Sonoda illustrates an embodiment using a beam splitter (82) for separating the beam.

Regarding claims 4,8,

In figure 1 Yamamoto et al illustrates separating the fundamental beam from the second harmonic beam via mirror (61) and in column 9 lines 45-55 describes modulating the signal.

Therefore, it would have been obvious to person having ordinary skill in the art to provide an optical arrangement for separating the output signal because it would allow for returning the fundamental wave back into the nonlinear crystal for harmonic generation as described by Yamamoto et al.

Regarding claim 5,

Figure 9 of Sonoda illustrates an embodiment providing a backward light, which is reflected by mirror (85) and fed back to the laser.

Regarding claim 6,15,

Figure 10 of Sonoda illustrates a grating (90), which reflects part of the beam and selects the wavelength.

Regarding claim 9,

Figure 18 of Sonoda illustrates a grating (92) reflecting a backward light from the laser and selects the wavelength.

Regarding claims 10,11,12,13,14,

Sonoda does disclose a birefringent band pass filter (14), which may be a thin film type filter (91) formed on the surface of laser 10, see figure 11 of Sonoda.

Regarding claim 16,17,

Figure 20 of Sonoda illustrates fiber grating (23) providing reflection and wavelength selection, where the light beam is converged into the fiber via lens (22).

Regarding claims 25-27,

Sonoda does not disclose intensity modulation of the output signal.

Yamamoto et al discloses modulation of signal but does not disclose modulating the signal as it is exited from the nonlinear crystal.

However, intensity modulation of laser signals is well known in the laser art as documented in 1992 by Urakami et al, described in column 3 lines 49-68 to column 4 line 4 and illustrated in figures 1-4.

Regarding claim 28,

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In column 1 lines 7-20, Yamamoto et al discloses using the laser device for optical information processing, which requires recording.

Therefore, it would have been obvious to use claimed wavelength conversion device within an optical information system, as suggested by Yamamoto et al.

Regarding claim 32,


In column 13 lines 45-68 to column 14 lines 1-19, Yamamoto et al discloses a bulk-type wavelength conversion having polarization inversion layers (3), which extend to the end surfaces of the crystal.


### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Armando Rodriguez whose telephone number is (703) 308-6218. The examiner can normally be reached on 10-hour day / M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-4881.

  
Armando Rodriguez  
Examiner  
Art Unit 2828

  
Paul Ip  
Supervisor  
Art Unit 2828

AR/PI